Operating Instructions

Capacitive rod electrode for level detection

VEGACAP 27

- Relay (DPDT)

Document ID: 33758

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Supplementary documentation

Information:
Supplementary documents appropriate to the ordered version come with the delivery. You can find them listed in chapter "*Product description*".

Instructions manuals for accessories and replacement parts

Tip:
To ensure reliable setup and operation of your VEGACAP 27, we offer accessories and replacement parts. The corresponding documentations are:

- 33761 - Oscillator CAP E31R

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1 About this document

1.1 Function

This operating instructions manual provides all the information you need for mounting, connection and setup as well as important instructions for maintenance and fault rectification. Please read this information before putting the instrument into operation and keep this manual accessible in the immediate vicinity of the device.

1.2 Target group

This operating instructions manual is directed to trained specialist personnel. The contents of this manual should be made available to these personnel and put into practice by them.

1.3 Symbolism used

Information, tip, note
This symbol indicates helpful additional information.

Caution: If this warning is ignored, faults or malfunctions can result.

Warning: If this warning is ignored, injury to persons and/or serious damage to the instrument can result.

Danger: If this warning is ignored, serious injury to persons and/or destruction of the instrument can result.

Ex applications
This symbol indicates special instructions for Ex applications.

- **List**
  The dot set in front indicates a list with no implied sequence.

→ **Action**
This arrow indicates a single action.

1 **Sequence of actions**
Numbers set in front indicate successive steps in a procedure.

Battery disposal
This symbol indicates special information about the disposal of batteries and accumulators.

2 For your safety

2.1 Authorised personnel

All operations described in this operating instructions manual must be carried out only by trained specialist personnel authorised by the plant operator.

During work on and with the device the required personal protective equipment must always be worn.

2.2 Appropriate use

The VEGACAP 27 is a sensor for point level detection.

You can find detailed information on the application range in chapter "*Product description*".

Operational reliability is ensured only if the instrument is properly used according to the specifications in the operating instructions manual as well as possible supplementary instructions.

For safety and warranty reasons, any invasive work on the device beyond that described in the operating instructions manual may be carried out only by personnel authorised by the manufacturer. Arbitrary conversions or modifications are explicitly forbidden.

2.3 Warning about incorrect use

Inappropriate or incorrect use of the instrument can give rise to application-specific hazards, e.g. vessel overfill or damage to system components through incorrect mounting or adjustment.

2.4 General safety instructions

This is a state-of-the-art instrument complying with all prevailing regulations and guidelines. The instrument must only be operated in a technically flawless and reliable condition. The operator is responsible for the trouble-free operation of the instrument.

During the entire duration of use, the user is obliged to determine the compliance of the necessary occupational safety measures with the current valid rules and regulations and also take note of new regulations.

The safety instructions in this operating instructions manual, the national installation standards as well as the valid safety regulations and accident prevention rules must be observed by the user.

For safety and warranty reasons, any invasive work on the device beyond that described in the operating instructions manual may be carried out only by personnel authorised by the manufacturer. Arbitrary conversions or modifications are explicitly forbidden.

The safety approval markings and safety tips on the device must also be observed.

2.5 Safety label on the instrument

The safety approval markings and safety tips on the device must be observed.

2.6 CE conformity

This device fulfills the legal requirements of the applicable EC guidelines. By attaching the CE mark, VEGA provides a confirmation of successful testing. You can find the CE conformity declaration in the download area of "www.vega.com".

2.7 Safety instructions for Ex areas

Please note the Ex-specific safety information for installation and operation in Ex areas. These safety instructions are part of the operating instructions manual and come with the Ex-approved instruments.

2.8 Environmental instructions

Protection of the environment is one of our most important duties. That is why we have introduced an environment management system with the goal of continuously improving company environmental protection. The environment management system is certified according to DIN EN ISO 14001.

Please help us fulfill this obligation by observing the environmental instructions in this manual:

- Chapter "*Packaging, transport and storage*"
- Chapter "*Disposal*"

3 Product description

3.1 Configuration

Scope of delivery

The scope of delivery encompasses:

- VEGACAP 27 point level switch
- Documentation
  - this operating instructions manual
  - if necessary, further documents

Constituent parts

The VEGACAP 27 consists of the components:

- Housing cover
- Housing with electronics
- Process fitting with electrode

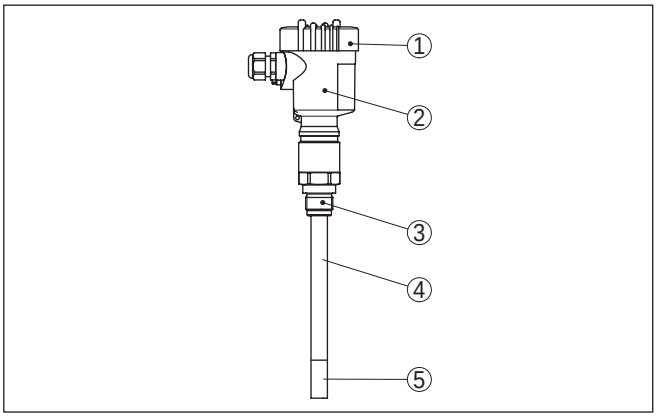

Fig. 1: VEGACAP 27 - with plastic housing

1 Housing cover
2 Housing with electronics
3 Process fitting
4 active screen segment
5 active probe

Type plate

The nameplate contains the most important data for identification and use of the instrument:

- Article number
- Serial number
- Technical data
- Article numbers, documentation

With the serial number, you can access the delivery data of the instrument via www.vega.com, "*VEGA Tools*" and "*serial number search*". In addition to the type label outside, you can also find the serial number on the inside of the instrument.

3.2 Principle of operation

Area of application

VEGACAP 27 is a point level sensor with fully insulated, capacitive electrode with screen segment and active tip for level detection.

VEGACAP 27 is very rugged and maintenance-free and can be used in all areas of industrial process technology.

Typical applications are overfill and dry run protection.

Setup of the instrument is very easy because an adjustment is not necessary. This means that changing products with different dielectric values, such as e.g. water and oil or conductive and non-conductive products, do not influence the settings on the instrument and their switching accuracy.

Fully insulated probes with screen segment like VEGACAP 27 are preferably used in conductive, very adhesive liquids.

Due to the mechanical constructions of the screen segment and the active tip, buildup on the probe can be compensated.

The capacitive measuring principle places no special requirements on installation. Hence, many different applications can be equipped with VEGACAP 27.

The instrument can also be used problem-free in corrosive products.

Functional principle

Probe, measured product and vessel wall form an electrical capacitor. The capacitance is influenced by three main factors.

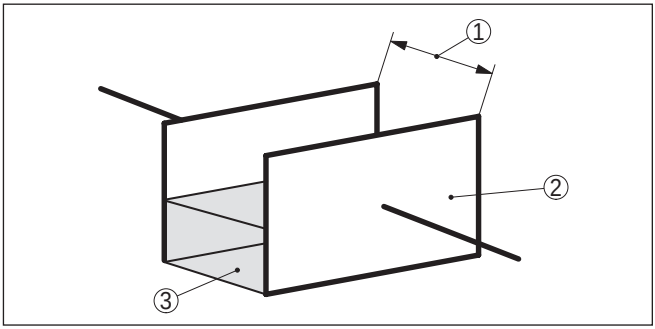

Fig. 2: Functional principle - Plate capacitor

1 Distance between the electrode surfaces
2 Size of the electrode surfaces
3 Type of dielectric between the electrodes

The probe and the vessel wall are the capacitor plates. The measured product is the dielectric. Due to the higher dielectric constant of the product compared to air, the capacitance increases as the probe is gradually covered.

The capacitance change is converted by the electronics module into a switching command.

Voltage supply

VEGACAP 27 is a compact instrument, i.e. it can be operated without external evaluation system. The integrated electronics evaluates the level signal and outputs a switching signal. With this switching signal,

a connected device can be operated directly (e.g. a warning system, a pump etc.).

The data for power supply are specified in chapter "*Technical data*".

3.3 Operation

The probe can be adapted to the dielectric constant of the product directly on the electronics module.

A switching command can be triggered when the probe is covered or laid bare.

On the electronics module you will find the following display and adjustment elements:

- Control lamp for indication of the switching status
- Potentiometer for switching point adaptation (covered)
- DIL switch for mode adjustment

3.4 Storage and transport

Packaging

Your instrument was protected by packaging during transport. Its capacity to handle normal loads during transport is assured by a test based on ISO 4180.

The packaging of standard instruments consists of environment-friendly, recyclable cardboard. For special versions, PE foam or PE foil is also used. Dispose of the packaging material via specialised recycling companies.

Transport

Transport must be carried out in due consideration of the notes on the transport packaging. Nonobservance of these instructions can cause damage to the device.

Transport inspection

The delivery must be checked for completeness and possible transit damage immediately at receipt. Ascertained transit damage or concealed defects must be appropriately dealt with.

Storage

Up to the time of installation, the packages must be left closed and stored according to the orientation and storage markings on the outside.

Unless otherwise indicated, the packages must be stored only under the following conditions:

- Not in the open
- Dry and dust free
- Not exposed to corrosive media
- Protected against solar radiation
- Avoiding mechanical shock and vibration

Storage and transport temperature

- Storage and transport temperature see chapter "*Supplement - Technical data - Ambient conditions*"
- Relative humidity 20 … 85 %

4 Mounting

4.1 General instructions

Suitability for the process conditions

Make sure that all parts of the instrument coming in direct contact with the process, especially the sensor element, process seal and process fitting, are suitable for the existing process conditions, such as process pressure, process temperature as well as the chemical properties of the medium.

You can find the specifications in chapter "*Technical data*" and on the nameplate.

Switching point

In general the level switch can be mounted in any position. The instrument must be mounted in such a way that the probe is at the height of the requested switching point.

Welding work

Before beginning the welding work, remove the electronics module from the sensor. By doing this, you avoid damage to the electronics through inductive coupling.

Handling

With threaded versions, the housing must not be used to screw in the instrument. Applying tightening forces on the housing can damage its internal parts.

Use the hexagon for screwing in.

Moisture

Use the recommended cables (see chapter "*Connecting to power supply*") and tighten the cable gland.

You can give your VEGACAP 27 additional protection against moisture penetration by leading the connection cable downward in front of the cable entry. Rain and condensation water can thus drain off. This applies mainly to outdoor mounting as well as installation in areas where high humidity is expected (e.g. through cleaning processes) or on cooled or heated vessels.

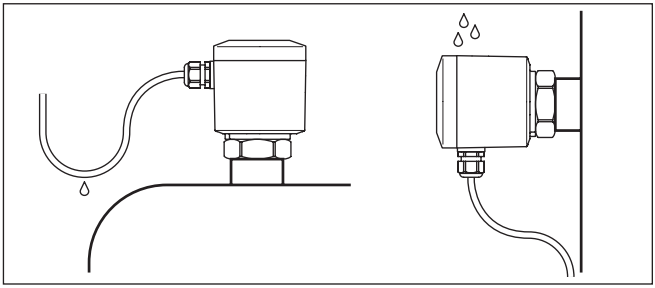

Fig. 3: Measures against moisture penetration

Transport

Do not hold VEGACAP 27 on the probe. Especially with heavy flange versions or long rod versions, the sensor can be damaged simply by the weight of the instrument.

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Pressure/Vacuum

The process fitting must be sealed if there is gauge or low pressure in the vessel. Before use, check if the seal material is resistant against the measured product and the process temperature.

The max. permissible pressure is specified in chapter "*Technical data*" or on the type label of the sensor.

4.2 Mounting instructions

Agitators and fluidization

Due to the effects of agitators, equipment vibration or similar, the level switch can be subjected to strong lateral forces. For this reason, do not use an overly long electrode for VEGACAP 27, but check if you can mount a short level switch on the side of the vessel in horizontal position.

Extreme vibration caused by the system, e.g. due to agitators or turbulence in the vessel from fluidisation, can cause the probe of VEGACAP 27 to vibrate in resonance. If a longer rod version is necessary, you can secure the probe by fastening a suitable brace or guy directly above the end of the rod.

Inflowing medium

If the instrument is mounted in the filling stream, unwanted false measurement signals can be generated. For this reason, mount the instrument at a position in the vessel where no disturbances, e.g. from filling openings, agitators, etc., can occur.

This applies particularly to instrument versions with a longer probe.

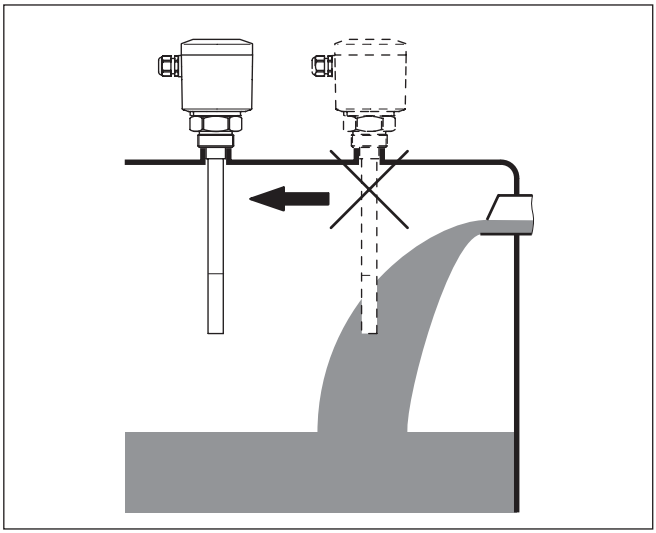

Fig. 4: Inflowing medium

5 Connecting to power supply

5.1 Preparing the connection

Note safety instructions

Always keep in mind the following safety instructions:

- Connect only in the complete absence of line voltage

Voltage supply

Connect the operating voltage according to the following connection diagrams. The electronics module CAP E31R is designed in protection class I. To maintain this protection class, it is absolutely necessary that the ground conductor be connected to the internal ground terminal. Take note of the general installation regulations.

The data for power supply are specified in chapter "*Technical data*".

Connection cable

The instrument is connected with standard three-wire cable without screen. If electromagnetic interference is expected which is above the test values of EN 61326 for industrial areas, screened cable should be used.

Use cable with round cross-section. A cable outer diameter of 5 … 9 mm (0.2 … 0.35 in) ensures the seal effect of the cable gland. If you are using cable with a different diameter or cross-section, exchange the seal or use a suitable cable gland.

Note:
When placing the housing cover, make sure that the inspection glass is above the signal lamp of the electronics module.

5.2 Wiring plan, single chamber housing

Wiring plan

We recommend connecting VEGACAP 27 in such a way that the switching circuit is open when there is a level signal, line break or failure (safe condition).

The relays are always shown in non-operative condition.

The two relays (DPDT) work synchronously. Hence it is possible to control also e.g. a horn and a magnet valve.

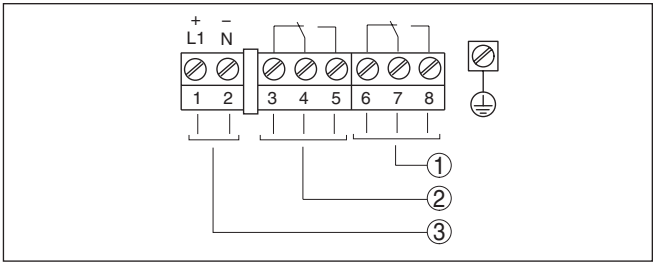

Fig. 5: Wiring plan

1 Relay output
2 Relay output
3 Voltage supply

6 Setup

6.1 General information

The figures in brackets refer to the following illustrations.

Function/Configuration

On the electronics module you will find the following display and adjustment elements:

- Potentiometer for switching point adaptation
- DIL switch for mode adjustment - A/B
- Control lamp

Note:
As a rule, always set the mode with the mode switch (5) before starting setup VEGACAP 27. The switching output will change if you set the mode switch (5) afterwards. This could possibly trigger other connected instruments or devices.

6.2 Adjustment elements

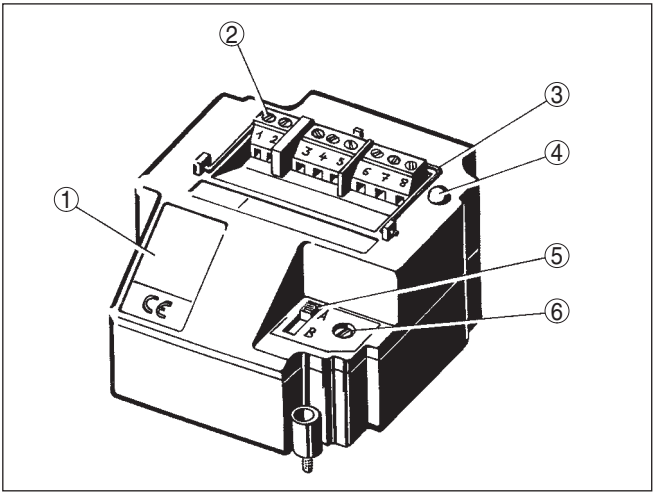

Fig. 6: Oscillator with relay output

1 Type plate
2 Connection terminals
3 Tensile proving ring
4 Control lamp
5 DIL switch for mode adjustment
6 Potentiometer for switching point adaptation

The switching status of the electronics can be checked with closed housing (only plastic housing), see "*Function chart*".

Note:
When placing the housing cover, make sure that the inspection glass is above the signal lamp (LED) of the electronics module.

To adjust VEGACAP 27, loosen first of all the four screws on the upper side of the instrument with a screwdriver and remove the housing cover.

Switching point adaptation (6)

You can adapt the switching point to the solid with the potentiometer.

The electronics is adjustment free and an adaption is only necessry in exceptions. See "*Exceptions*".

Mode adjustment (5)

With the mode switch you can change the switching condition of the relay. You can set the required mode (A - max. detection or overfill protection, B - min. detection or dry run protection).

We recommend connecting according to the quiescent current principle (relay contact deenergizes when the switching point is reached), because the relay always takes on the same (safe) condition if a failure is detected or in case of mains failure.

Signal lamp (4)

Control lamp for indication of the switching status

- Control lamp on = Relay deenergised

Switching point adjustment

The measuring system is immediately ready for operation.

The switching point must no longer be set with VEGACAP 27.

The probe has an active tip and a screen segment. Thanks to the screen segment, the so called standing capacitance, caused by the vessel after installation of the probe, is mainly compensated.

As a default setting, the electronics module is adjusted to the basic capacitance of the probe. The relay output switching when the active tip is covered (active tip: 50 … 150 mm / 2 … 5.9 in) of the electrode.

Changing dielectric values of the products, such as e.g. caused in mixing vessels are no problem for the switching accuracy within the active pin. The selection of the electrode length is hence very important because the length of the electrode determines the switching point. This switching point cannot be shifted on the electrode.

Exceptions

In exceptions, e.g. in pipelines or if the probe is mounted very close to the vessel wall, it can happen ath the probe signals already overfilling (covering) in uncovered condition.

In this case, the switching point must be re-adjusted.

For adjustment, the vessel must not be filled and the switching point adjustment is also possible in dismounted condition.

A fresh adjustment is necessary in the following cases:

- for probes with a length of more than 3 m (9.8 ft)
- in narrow space installation conditions with high standing capacitance (e.g. in tubes etc.)
- after exchange of the electronics module

Fresh adjustment

Proceed as follows for a fresh adjustment:

1. Make sure that the probe is uncovered.
2. Pierce the cover of the potentiometer (6) with a screwdriver.

3. Turn the below potentiometer (6) first of all anticlockwise (max. 20 turns) until the control lamp signals "covered".

   Mode A (overfill protection) = control lamp lights

   Mode B (dry run protection) = control lamp extinguishes

   If this condition is already reached, you can continue with the next step.
4. Turn the potentiometer (6) very slowly (due to the damping) clockwise until the control lamp signals "uncovered".

   Mode A (overfill protection) = control lamp extinguishes

   Mode B (dry run protection) = control lamp lights
5. Turn the potentiometer (6) clockwise according to the following chart.
6. The probe is now ready for operation.

Sensitivity

	Standard	very sensitive
additional turns	Dielectric constant >2 = 2 turns	Dielectric constant >1.5 = 1 turn

Tab. 1: Number of additional turns for the potentiometer (6)

Note:
With the measurement of products with very low dielectric values, the number of turns can be reduced up to 1 according to the chart.

This setting is too sensitive with conductive, adhesive products.

Note:
When placing the housing cover, make sure that the inspection glass is above the signal lamp of the electronics module.

6.3 Function chart

The following chart provides an overview of the switching conditions depending on the set mode and the level.

	Level	Switching status	Control lamp
Mode A Overflow protection		 Relay energized	○
Mode A Overflow protection		 Relay deenergized	☼

	Level	Switching status	Control lamp
Mode B Dry run protection		 Relay energized	○
Mode B Dry run protection		 Relay deener-gized	
Failure of the sup-ply voltage (mode A/B)	any	 Relay deener-gized	○

7 Maintenance and fault rectification

7.1 Maintenance

If the instrument is used properly, no special maintenance is required in normal operation.

7.2 Rectify faults

Reaction when malfunctions occur

The operator of the system is responsible for taking suitable measures to rectify faults.

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Failure reasons

VEGACAP 27 offers maximum reliability. Nevertheless, faults can occur during operation. These may be caused by the following, e.g.:

- Sensor
- Process
- Voltage supply
- Signal processing

Fault rectification

The first measure to be taken is to check the output signal. In many cases, the causes can be determined this way and the faults rectified.

24 hour service hotline

Should these measures not be successful, please call in urgent cases the VEGA service hotline under the phone no. **+49 1805 858550**.

The hotline is available to you 7 days a week round-the-clock. Since we offer this service world-wide, the support is only available in the English language. The service is free of charge, only the standard telephone costs will be charged.

Checking the switching signal

Error	Cause	Rectification
– The instrument signals covered without covering with the medium – The instrument signals covered with covering with the medium	Wrong mode selected	Set the correct mode on the mode switch (A - overflow protection, B - dry run protection). Wiring should be carried out according to the quiescent current principle.
	Operating voltage too low	Check operating voltage
	Shortcircuit in the probe, e.g. because of moisture in the housing	Remove the electronics module. Check the resistance between the marked plug connections. See the following instructions.
	Electronics defective	Press the mode switch (A/B). If the instrument then changes the mode, the instrument may be mechanically damaged. Should the switching function in the correct mode still be faulty, return the probe for repair. Push the mode switch. If the probe then does not change the mode, the electronics module may be defective. Exchange the electronics module.

Check the resistance in the probe

Remove the electronics module. Check the resistance between the two plug connections.

There must no longer be a connection (high impedance). If there is still a connection - exchange the instrument or return it for repair

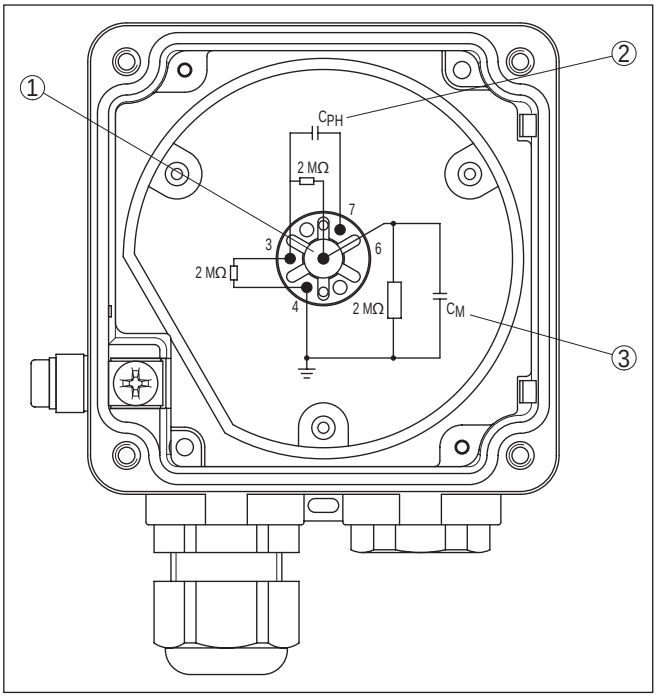

Fig. 21: Check the resistance in the probe

1 Contact 1 (middle pin)
2 Variable capacitor (phase)
3 Capacitor

Measure the resistance values between the following contacts with an ohmmeter (range MΩ).

Contact 4 against contact 1 (middle pin)
The resistor must be 2 MΩ.

If the resistor is lower, this means moisture in the housing or a fault in the electrode insulation. A possible reason could be also a non-insulated electrode which is used in a conductive (humid) medium.

If the resistor is higher or if the connection is interrupted, the reason is mostly a contact error in the adapter plate or a defective resistor due to strong electrostatic arking.

In both cases, the probe must be repaired in our premises.

Contact 4 against vessel
The electrical connection between contact 4 and metal vessel (not the mounting boss or probe flange) should good. Measure the resistance value between contact 4 and vessel with an ohmmeter (range very small).

- Shortcircuit (0 … 3 Ω) - optimum connection
- Resistor > 3 Ω - bad connection

If the resistance value is > 3 Ω, this can be due to corrosion on the thread or flange or the thread was covered e.g. with teflon tape.

Check the connection to the vessel. If there is no connection, you can connect a cable from the outer ground terminal to the vessel.

Keep in mind that coated flanges must always be connected via the ground terminal to the vessel.

Contact 7 against contact 1 (middle pin)
The resistor must be infinite (> 10 MΩ)

If the resistor is lower, then moisture can be penetrated or the compensation capacitor or variable capacitor (phase) is defective.

Contact 3 (screen) against contact 4
The resistor must be 2 MΩ.

In case of lower values, the electrode insulation is defective or moisture is penetrated into the housing.

In case of higher values, there is a contacting error in the adapter plate or the resistor is defective.

No fault
If you cannot find a fault in the probe, then exchange the electronics module by a similar replacement electronics (if available).

If the fault is eliminated after inserting the new electronics module, then you have to carry out a fresh adjustment with the new electronics module because electronics modules have certain manufacturing tolerances.

If the fault still exists or if no replacement electronics module is available, then you have to return the probe for repair.

Contact 3 (screen) against contact 1 (middle pin)
The resistor must be 2 MΩ.

In case of lower values, the electrode insulation is defective or moisture is penetrated into the housing.

In case of higher values, there is a contacting error in the adapter plate or the resistor is defective.

Reaction after fault rectification

Depending on the reason for the fault and the measures taken, the steps described in chapter "*Set up*" may have to be carried out again.

7.3 Exchanging the electronics module

If it is necessary to exchange the electronics module, you should use an electronics module type CAP E31R

Proceed as follows:

1. Switch off power supply
2. Loosen the four screws of the housing cover with a Phillips screwdriver.
3. Remove the housing cover
4. Loosen the screws of the terminals with a Allen wrench.
5. Pull the connection cables out of the terminals.

6. Loosen the two screws with a Torx screwdriver.
7. Open the tensile ring on the old electronics module and pull out the old electronics module.
8. Compare the new electronics module with the old one. The type label of the electronics module must correspond to that of the old electronics module.
9. Insert the new electronics module.
10. Screw in and tighten the two screws with a Torx screwdriver.
11. Lead the connection cable through the cable gland.
12. Insert the wire ends into the open terminals according to the wiring plan and tighten them.
13. Check the hold of the wires in the terminals by lightly pulling on them.
14. Tighten cable gland and check on tightness. The seal ring must completely encircle the cable.
15. Carry out a fresh adjustment. See chapter "*Set up, new adjustment*".
16. Screw the housing cover back on

The electronics exchange is now finished.

7.4 How to proceed in case of repair

You can find a repair form as well as detailed information on how to proceed under www.vega.com/downloads and "*Forms and certificates*".

By doing this you help us carry out the repair quickly and without having to call back for needed information.

If a repair is necessary, please proceed as follows:

- Print and fill out one form per instrument
- Clean the instrument and pack it damage-proof
- Attach the completed form and, if need be, also a safety data sheet outside on the packaging
- Please contact for the return shipment the agency serving you. You can find the agency on our home page www.vega.com.

8 Dismounting

8.1 Dismounting steps

Warning:
Before dismounting, be aware of dangerous process conditions such as e.g. pressure in the vessel, high temperatures, corrosive or toxic products etc.

Take note of chapters "*Mounting*" and "*Connecting to power supply*" and carry out the listed steps in reverse order.

8.2 Disposal

The instrument consists of materials which can be recycled by specialised recycling companies. We use recyclable materials and have designed the parts to be easily separable.

WEEE directive 2002/96/EG
This instrument is not subject to the WEEE directive 2002/96/EG and the respective national laws. Pass the instrument directly on to a specialised recycling company and do not use the municipal collecting points. These may be used only for privately used products according to the WEEE directive.

Correct disposal avoids negative effects on humans and the environment and ensures recycling of useful raw materials.

Materials: see chapter "*Technical data*"

If you have no way to dispose of the old instrument properly, please contact us concerning return and disposal.

9 Supplement

9.1 Technical data

General data

Material 316L corresponds to 1.4404 or 1.4435	
Materials, wetted parts	
– Process fitting - thread	316L, 316Ti or Aluminium
– Process fitting - Tri-Clamp	316Ti
– Process fitting - bolting DN 50	316Ti
– Process seal	Klingersil C-4400
– insulation (fully insulated)	PTFE
– Probe (rod PTFE fully insulated: ø 16 mm/0.63 in)	316L or 316Ti
Materials, non-wetted parts	
– Housing	Plastic PBT (polyester), Alu die-casting powder-coated
– Seal between housing and housing cover	Silicone (Aluminium/plastic housing)
– Temperature adapter (optional)	316Ti
– Ground terminal	316L
Process fittings	
– Pipe thread, cylindrical (DIN 3852-A)	G1 A, G1½ A
– American pipe thread, conical (ASME B1.20.1)	1 NPT, 1½ NPT
– hygienic fittings	Bolting DN 50, Clamp 1½" PN 16 DIN 32676, ISO 2852/316L, Clamp 2" PN 16 (ø 64 mm) DIN 32676, ISO 2852/316L
Weight	
– Instrument weight (depending on process fitting)	0.8 … 4 kg (0.18 … 8.82 lbs)
– Rod weight: ø 20 mm (0.787 in)	1100 g/m (12 oz/ft)
Sensor length (L)	250 … 4000 mm (9.843 … 157.48 in)
Active tip (LA)	50 … 150 mm (1.968 … 5.9 in)
Max. lateral load	10 Nm (7.4 lbf ft)
Max. torque (process fitting - thread)	100 Nm (74 lbf ft)
Measuring frequency	430 kHz

Output variable

Output	Relay output (DPDT), 2 floating spdts
Switching voltage	
– Min.	10 mV
– Max.	253 V AC, 253 V DC With circuits > 150 V AC/DC, the relay contacts must be in the same circuit.

Switching current	
– Min.	10 µA
– Max.	3 A AC, 1 A DC
Breaking capacity	
– Min.	50 mW
– Max.	750 VA AC, 54 W DC
	If inductive loads or stronger currents are switched through, the gold plating on the relay contact surface will be permanently damaged. The contact is then no longer suitable for switching low-level signal circuits.
Potential separation	> 500 V DC
Contact material (relay contacts)	AgNi (Au plated) or AgSnO (Au plated)
Modes (switchable)	A (overfill protection)/B (dry run protection)
Switching delay	
– When immersed	0.7 s
– When laid bare	0.7 s
– In case of failure	1 s

Ambient conditions	
Ambient temperature on the housing	-40 … +80 °C (-40 … +176 °F)
Storage and transport temperature	-40 … +80 °C (-40 … +176 °F)

Process conditions	
Process pressure	-1 … 63 bar/-100 … 6300 kPa (-14.5 … 914 psig)
	See following diagram
Process temperature	See following diagram

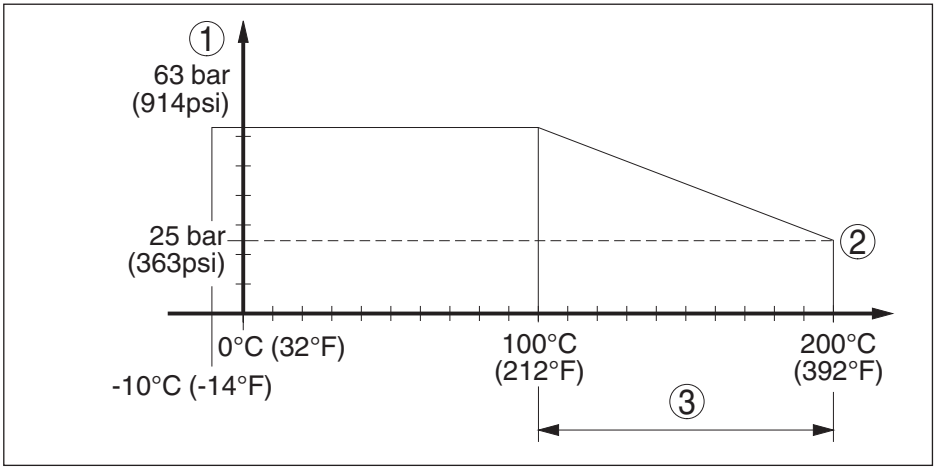

Fig. 22: Process pressure - Process temperature - VEGACAP 27 with process fitting of 316L

1 Process pressure
2 Process temperature
3 Temperature range with temperature adapter

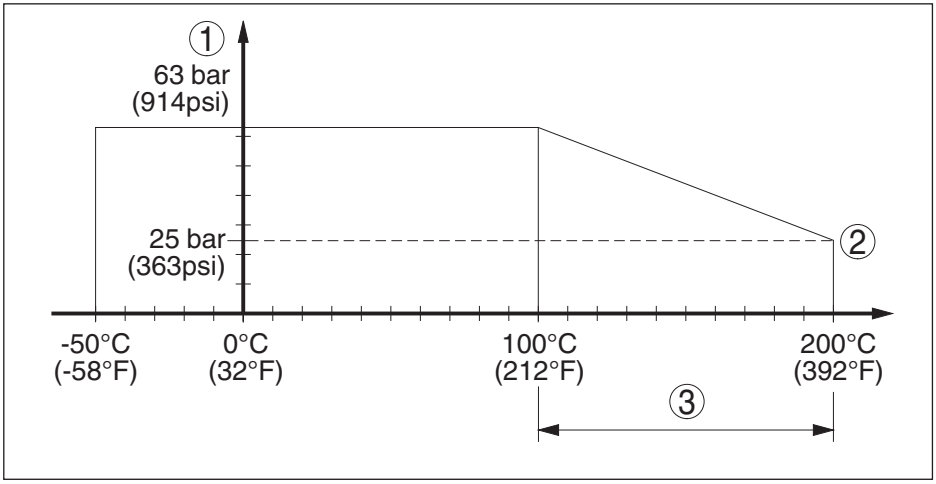

Fig. 23: Process pressure - Process temperature - VEGACAP 27 with process fitting of 316Ti

1 Process pressure
2 Process temperature
3 Temperature range with temperature adapter

Dielectric constant	≥ 1.5

Electromechanical data

Cable entry/plug (dependent on the version)

– Single chamber housing	– 1 x cable entry M20 x 1.5 (cable: ø 5 … 9 mm), 1 x blind plug M20 x 1.5; attached 1 x cable entry M20 x 1.5 or: – 1 x cable entry ½ NPT, 1 x blind plug ½ NPT, 1 x cable entry ½ NPT or: – 1 x plug M12 x 1; 1 x blind plug M20 x 1.5
Screw terminals	for wire cross-section up to 1.5 mm² (AWG 16)

Adjustment elements

Mode switch	
– A	Min. detection or dry run protection
– B	Max. detection or overflow protection
Potentiometer	Switching point adaptation

Voltage supply

Operating voltage	20 … 253 V AC, 50/60 Hz, 20 … 72 V DC (at U >60 V DC, the ambient temperature can be max. 50 °C/122 °F)
Power consumption	1 … 9 VA (AC), approximately 1.5 W (DC)

Electrical protective measures

Protection rating	IP 66/IP 67
Overvoltage category	III
Protection class	I

Approvals

Instruments with approvals can have different technical data depending on the version.

For that reason the associated approval documents of these instruments have to be carefully noted. They are part of the delivery or can be downloaded under www.vega.com via "*VEGA Tools*" and "*serial number search*" as well as via "*Downloads*" and "*Approvals*".

9.2 Dimensions

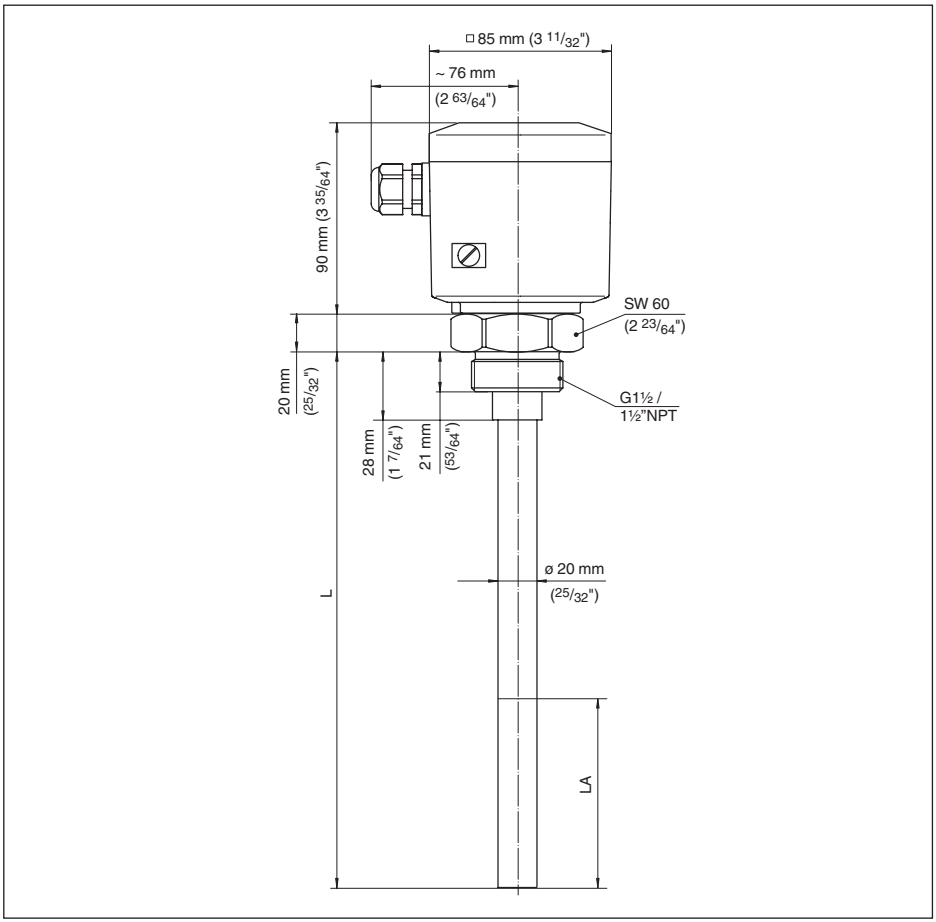

Fig. 24: VEGACAP 27, threaded version G1½ A (ISO 228 T1)

L = Sensor length, see chapter "Technical data"
LA = active tip, see chapter "Technical data"

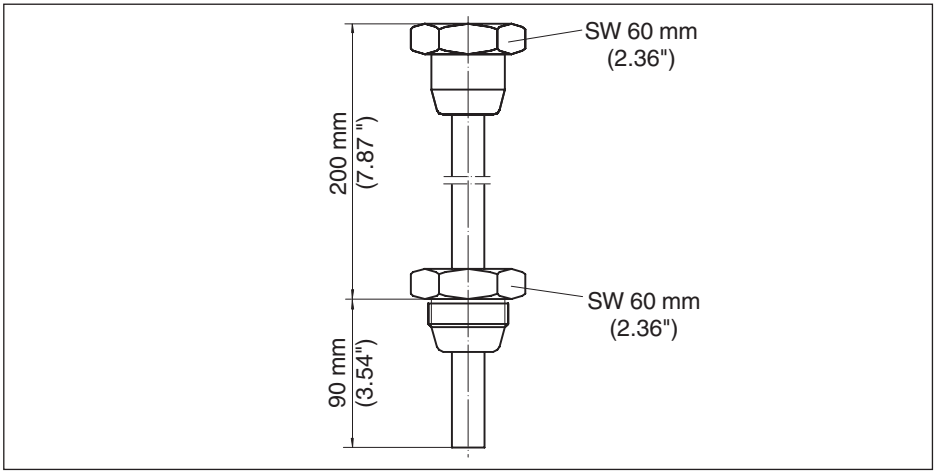

Fig. 25: Temperature adapter (optional) 316L, 316Ti

9.3 Industrial property rights

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All statements concerning scope of delivery, application, practical use and operating conditions of the sensors and processing systems correspond to the information available at the time of printing.
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VEGA Grieshaber KG
Am Hohenstein 113
77761 Schiltach
Germany

Phone +49 7836 50-0
Fax +49 7836 50-201
E-mail: info.de@vega.com
www.vega.com